DEPARTMENT OF THE NAVY
HEADQUARTERS UNITED STATES MARINE CORPS
WASHINGTON, DC 20380-0001

MCO 8420.8
SST
19 Apr 91

MARINE CORPS ORDER 8420.8

From: Commandant of the Marine Corps
To: Distribution List

Subj: MATERIEL FIELDING PLAN (MFP) FOR THE COMBINED ARMS STAFF TRAINER (CAST)

Encl: (1) Materiel Fielding Plan for the Combined Arms Staff Trainer (CAST)

1. Purpose. To provide information and instructions concerning the fielding of the Combined Arms Staff Trainer (CAST).

2. Information. The CAST provides realistic fire support training for Marine Air-Ground Task Force (MAGTF) staffs up to and including Marine Expeditionary Force (MEF) level. The trainer exercises the MAGTF staff in fire support employment, coordination, and integration. It visually displays the impact of supporting arms fire and realistically portrays maneuver forces.

3. Action. The commanders of each organizational element concerned shall ensure implementation of the provisions of this Order.

4. Reserve Applicability. This Order is not applicable to the Marine Corps Reserve.

J. W. PEARSON III
By direction

DISTRIBUTION: PCN 10210651200

Copy to: 7000110 (55)
8145004, 005 (2)
7000144/8145001 (1)

MATERIEL FIELDING PLAN

FOR THE COMBINED ARMS STAFF TRAINER (CAST)

1. Introduction

a. Source of the Requirement. The requirement for the development of CAST is outlined in Required Operational Capability (ROC) No. TNG 419.4.1 dated 3 June 1987.

b. Points of Contact. All questions concerning the CAST shall be directed to the following in writing

NAME	COMMAND/TELEPHONE
Capt Schuler	CAST Project Officer for Training Systems (PO TRASYS), MCRDAC, Quantico, VA 22134-5001 AV/DSN: 278-2546 COM: (703) 640-2546
Mr. D. Freer	CAST Project Manager, Naval Training Systems Center (NTSC), Orlando, FL 32826-3224 AV/DSN: 960-4181 COM: (407) 380-4181
Capt Jensen	CAST Project Officer, Training and Audio Visual Support Center (TAVSC), Camp Pendleton, CA 92055-5001 AV/DSN: 365-6478 COM: (619) 725-6478
Capt Seale	CAST Project Officer (PO), Camp Pendleton, CA 92055-5001 AV/DSN: 365-4444 COM: (619) 725-4444
LtCol Robb	CAST Project Officer, Training Support Center (TSC), Camp Lejeune, NC 28542-5001 AV/DSN: 484-3733 COM: (919) 451-3733
Maj Clarkson	CAST Project Officer (PO), Camp Lejeune, NC 28542-5001 AV/DSN: 484-2102 COM: (919) 451-2102

Mr. Steward	CAST Project Officer, Training and Audio Visual Support Center (TAVSC), Camp Butler, JA 98773-5001 AV/DSN: 635-2215 COM: 011-819-889-2511 (ask for 635-2215)
MGySgt Noumon	CAST Project Officer, Training and Audio Visual Support Center (TAVSC), Kanehoe Bay, HI 96863-5001 AV/DSN: 457-1365 COM: (808) 257-2423
Capt Gran	CAST Project Officer (PO), 29 Palms, CA 92278-5001 AV/DSN: 952-6117/7378 COM: (619) 368-6117
Mr. R. Andersen	CAST Project Officer, Training and Audio Visual Support Center (TAVSC), Quantico, VA 22134-5001 AV/DSN: 278-3218 COM: (703) 640-3218

c. Fielding Methodology

(1) General Fielding Plan. The device will be horizontally fielded, one system per site. This will facilitate the maximum number of personnel trained in fire support employment, coordination, and integration.

(2) Method of Fielding

(a) After initial installation and testing by contractor technicians, NTSC personnel will perform an inventory and acceptance test. Custody of the device will then be transferred to the local TAVSC/TSC.

(b) Requests for modifications by using units will be prepared and submitted in accordance with NAVTRASYSCENINST 4720.1K (Procedures for Field Requests for Changes to Cognizance Symbol 2"0" Training Systems) with information to PMTRASYS, MCRDAC, and procedures established by the local TAVSC/TSC. Modifications, when deemed necessary, will be performed through Contractor Operator Maintenance of Simulator (COMS).

d. Replaced Systems Equipment. The baseline for all CAST developments, located at Twentynine Palms, will be modified and

brought on line with the five new systems. No other devices will be replaced.

2. System Description

a. Administrative Information

(1) Nomenclature. Combined Arms Staff Trainer (CAST).

(2) TAMCN. N/A

(3) SAC. N/A

(4) NSN. Local NSN (LNSN) assigned by NTSC:

Device:	16N8A (Kaneohe Bay)	6910-LLC00-7002
	16N8B (Camp Lejeune)	6910-LLC00-7003
	16N8C (Camp Butler)	6910-LLC00-7004
	16N8D (Camp Pendleton)	6910-LLC00-7005
	16N8E (Quantico)	6910-LLC00-7006
	*16N8F (29 Palms)	6910-LLC00-7007

*Original device (16N8) will be modified.

(5) Unit of Issue. Each.

(6) Unit Cost. $1,011,739.

(7) Support Cost. Universal Ground Marine Corps Contractor Operation and Maintenance of Simulator (COMS). See paragraph 3, below.

(8) Petroleum, Oil, and Lubricants (POL). N/A

(9) Equipment Density. N/A

(10) Readiness Reporting. N/A

b. Physical Characteristics. Dimensions (l = length, w = width, h = height, d = depth) and weights of CAST components are listed below. Since the system is installed in a specially developed facility (and not intended for repetitive shipping or storage), storage/shipping configurations are not provided. Power requirements have been taken into consideration in planning for/construction of the CAST facility, therefore separate arrangements in this respect need not be made.

Item	Dimensions	Wt (Est)
1. Terrain Board	4’l x 8’w	100 lbs

Item	Dimensions	Wt (Est)
2. Terrain Board Storage Rack	8’l x 4’5"w x 8’h	150 lbs
3. Terrain Board Support (fixed)	16’l x 12’w	150 lbs
4. Terrain Board Support (movable)	8’l x 12’w	150 lbs
5. Fire Marking System (FMS) Display Processor	17"d x 19"w x 8"h	30 lbs
6. FMS Projection System	48"l x 30"w x 12"h	150 lbs
7. FMS Elex. Enclosure	23"d x 20"w x 15"h	75 lbs
8. Company Table	6’1 x 2’w x 30"h	65 lbs
9. Video System Camera and Drive	9"d x 10"w x 15"h	15 lbs
10. Video System 29 inch Monitor	20"d x 27"w x 25"h	78 lbs
11. LED Clock Display	18’1 x 7"w x 8"d	5 lbs
12. PA Amplifier	17"w x 4"h x 11"d	18 lbs
13. PA and Communications Speakers	12"h x 10"w x 4’1d	5 lbs
14. Computer	7"h x 19"w x 21"d	37 lbs
15. Monitor	14"h x 15"w x 16"d	35 lbs
16. Florescent Light	4’1 x 8"w x 4"d	20 lbs
17. Communications Distribution Panel	24"w x 30"h x 8"d	100 lbs
18. FMS Support Mechanism (movable)	65"l x 4’w	50 lbs
19. FMS Support Mechanism (fixed)	22"l x 4’w	75 lbs
20. EWC Enclosure	24"w x 6’h x 30"d	150 lbs
21. Storage Rack	8’h x 4’w x 18"d	125 lbs

ENCLOSURE (1)

Item	Dimensions	Wt (Est)
22. Printer	18"w x 6"h x 20"d	40 lbs
23. Line Controller	11"w x 5"h x 8"d	5 lbs

c. Operational Characteristics

(1) The CAST is a training device that is composed of four device subsystems each of which requires a detailed functional description. The CAST provides the user with the necessary simulated cues and stimulation. It requires a communications subsystem to provide battlefield input to the staff and to allow the staff to execute procedures thus providing the desired practice to the staff. The battlefield (maneuver surface) is reproduced to provide the company staffs and controllers a depiction of unit and equipment locations in order that battle tactics may be executed. These tactics and procedures generate the situations that exercise the staff and achieve the desired training/practice goals. The maneuver surface is in effect a situation generator. The maneuver surface for the CAST shall be either a large (12 by 32 feet) three dimensional maneuver surface, or map surface. The use of either surface is acceptable in simulating the combat environment. Small segments of the surface may be used if desired.

(2) The training device provides a response to the actions of the users by replicating the resultant actions of requests for fire support by marking the maneuver surface at the point of supporting arms impact. This is the CAST fire marking system (FMS). This subsystem is an overhead laser illumination device that illuminates the maneuver surface indicating the points of impact of both friendly and opposing force supporting arms fires. The FMS is driven by a computer subsystem that controls the time and location of the fire impact indications. The computer subsystem receives its input from keyboards located in the Direct Air Support Group (DASC), Fire Direction Center (FDC), Tactical Evaluation Control Group (TECG), Combat Service Support Element (CSSE), and pilot cells. Once requests for fire support are received, processed, and approved for firing/ execution by the providing agency (artillery FDC’s, DASC’s, SACC, mortar FDC’s etc.) the fire order is input into the computer which then processes the request, applies preprogrammed delay factors, and fires the mission based upon directed location and the exercise time line. All events are keyed to the scenario/exercise time line. The general sequence of events is as follows:

(a) The request for fire support is generated by those at the maneuver surface via the communication subsystem

using normal request procedures (missions may have been prescheduled);

(b) Battalion, higher headquarters, and agencies execute procedures to effect the fire (approve, pass-on, refuse, coordinate, cancel, etc.);

(c) The fire request is input into the computer subsystem through a keyboard by the appropriate agency (TECG terminal operator);

(d) The computer applies delay factors and sequences requests based on exercise time line;

(e) The computer directs the FMS to illuminate the point of impact on the maneuver surface at the appropriate time;

(f) The FMS illuminates the maneuver surface with appropriate illumination for the required duration;

(g) The maneuver surface observers (company staffs and controllers <TECG>) adjust/control fire using communication subsystem and normal control/coordination procedures;

(h) The computer/FMS adjusts the impact points.

d. Associated Systems and Equipment. Theme is no associated system or equipment used in conjunction with CAST.

3. Logistic Support

a. Maintenance Support

(1) Maintenance on the CAST will be performed at two levels: onsite and depot. This is feasible due to the use of commercial off-the-shelf (COTS) computer assemblies, maintenance and test programs, and COMS. Experience with similar systems supports this concept as being more cost effective than developing an intermediate shop equipment repair capability. The need for depot level maintenance will be minimized through design control and selection of COTS equipment. Organizational level maintenance is supported by the use of extensive maintenance and test programs. The proper execution of all maintenance tests and procedures will be clearly explained in the CAST maintenance manuals. As onsite and off-site repair will be performed by COMS personnel and commercial manufacturers, respectively, standard commercially available support equipment will be recommended. Organizational level maintenance for the device will be performed by trained unit device operators and will consist of visual inspection, use of built-in-test (BIT) and self-diagnostics for

fault isolation, replacement of minor components such as light bulbs, lubrication, cleaning and minor adjustment not requiring special tools and equipment.

(2) Depot level maintenance will be performed by contractor personnel to effect repairs on designated replaceable assemblies and modules. Maintenance will usually be performed onsite to facilitate training needs, but extensive repairs could require shipment of components back to the contractor/ manufacturer facilities. Depot level maintenance will include overhaul, rebuild, and modifications. COMS is budgeted for and managed through Training and Education Center (T&E Center), Marine Corps Combat Development Center (MCCDC), and administered by NTSC.

b. Contractor Support Requirements. Interim Contractor Support (ICS). For 90 days after fielding, the system will be supported through ICS and NTSC personnel (COMS personnel shall be in a mobilization period at this time.). Interim contractor support will take the form of on-call engineering services through the prime using initially provisioned items.

c. Manpower, Personnel, and Training

(1) Personnel Requirements

(a) No modifications to existing Tables of Organization (T/0's) will be necessary to operate and maintain the device due to COMS operation and maintenance support. An initial training course will be offered through the prime contractor for instructors and maintainers for each device.

(b) Though the CAST does not call for changes to T/O's, the following list of operational personnel is recommended to effectively manage/operate the device. To ensure an adequate experience level, the personnel should be in the grades of captain/major.

Quantity	Title	MOS
1	Artillery representative	0802
1	Infantry representative	0302
1	Forward Air Controller	7202
1	Intell representative	0202
1	Comm/EW representative	2502
1	Armor representative	1802

(2) Training Requirements. A sixty-four hour training course entitled "User's Orientation Training Program" will be taught at each of the following sites for a maximum of 20 persons

per site. Except for the system at Twentynine Palms, classes will be scheduled for the first Monday after acceptance of the device. After the initially funded course, it will be at the discretion of the owning unit as to the use of on-the-job training (OJT) or establishment of a local school to train future operational personnel. In the case of Twentynine Palms (and its already established usage schedule), the orientation class will be conducted in consonance with/prior to the acceptance.

Location	Start Date (Est)
Kaneohe Bay, HI	May/June 1991
Camp Lejeune, NC	July 1991
Camp Butler, JA	Jan 1995
Camp Pendleton, CA	Mar/Apr 1992
Quantico, VA	Jun 1995
Twentynine Palms, CA	Jan 1992

(3) Training Support Items. There are no new training support items required.

d. Supply Support. Accompanying spare parts will be shipped with each device to the local TAVSC/TSC in addition to levels maintained by the cognizant COMS contractor.

e. Support Equipment. Only one piece of special tool/test equipment has been identified, a laser power meter. This meter will be furnished with each CAST device. Since routine repairs are effected through the COMS contractor, common tools, special and general purpose test equipment, and test program sets need not be specifically addressed in this MFP.

f. Technical Publications (TP)

(1) The Instructor Utilization Handbook (IUH), On-the-Job Handbook (OJT), Technical Maintenance Manual, Planned Maintenance System (PMS) Manual with Supplementary Data (Commercial Equipment) will be provided by NTSC to each site at the time of fielding. Modification to these manuals and procedures is not required or authorized. Any recommendations for change will be made in accordance with procedures outlined by the local TAVSC/TSC.

(2) Publication Control Numbers (PCN’s) will not be assigned to these manuals as they will neither be coordinated through Headquarters, Marine Corps, nor stocked at MCLB, Albany, Georgia. Additional copies of these manuals may be obtained through:

Naval Training Systems Center
Code 44
12350 Research Parkway
Orlando, FL 32826-3224
AV/DSN: 960-4929; COM: (407) 280-4929

g. Computer Resource Support. In accordance with NAVTRAEQUIPCEN Instruction 4410.4B, Assignment of Cognizance Symbol 2"0" Training Designators, this system has been designated a Cog 2"0" device. As a result, NTSC is designated the configuration manager and is responsible for post deployment software support of the system. Requests for changes in trainer configuration or software should be addressed to NTSC, via the Director, TAVSC/TSC.

h. Facilities

(1) Existing Facilities. Because device 16N8F (Twentynine Palms) is an upgrade to the existing system, it will be located in the same facility as the extent device.

(2) New Facilities. All devices, except Twentynine Palms, will occupy new military construction facilities. Construction will be monitored by NTSC personnel.

(3) Interim Facilities. There is no requirement for the utilization of interim facilities.

i. Packaging, Handling, Storage, and Transportation. All packaging, handling, storage, and transportation of CAST components will be handled through the prime contractor, Southwest Research Institute, San Antonio, Texas.

j. Warranties. N/A

4. Actions Required To Place Equipment In Service

a. Gaining Commands. The following actions should be accomplished by the gaining command:

(1) Select qualified personnel to attend training.

(2) Designate work area for COMS personnel.

(3) Designate area for storage of spare components.

(4) Designate project officer as liaison for installation and testing.

(5) Procedures should be implemented for the reporting of system failures to the cognizant TAVSC/TSC.

(6) There is a minimum of three permanent personnel required to operate the CAST. The remaining operators should be drawn from the using unit.

b. MCLB, Albany, GA. There are no actions required of the Marine Corps logistics bases in support of this program.

LIST OF ALLOWANCES AND DELIVERY SCHEDULES

UNIT	ACTUAL ALLOWANCE	PLANNED FY QTR 1	2	3	4	
Kaneohe Bay, HI	1			X		(91)
Camp Lejeune, NC	1				X	(91)
Camp Pendleton, CA	1		X			(92)
Camp Butler, JA	1	X				(95)
Twentynine Palms, CA	1		X			(92)
Quantico, VA	1			X		(95)

SCHEDULE OF EVENTS

EVENT	DATE
Contract Award	Sep 89
Contract Design Review	Jun 90
Functional Configuration Audit (16N8A)	Oct 90
Contractor Preliminary Inspection (16N8A)	Oct 90
Government Preliminary Inspection (16N8A)	Dec 90
Government Final Onsite Inspection (16N8A)	Apr 91
Functional Configuration Audit (16N8B)	Mar 91
Contractor Preliminary Inspection (16N8B)	Feb 91
Government Preliminary Inspection (16N8B)	Mar 91
Government Final Onsite Inspection (16N8B)	Jun 91
Functional Configuration Audit (16N8C)	Jun 94
Contractor Preliminary Inspection (16N8C)	Jun 94
Government Preliminary Inspection (16N8C)	Jun 94
Government Final Onsite Inspection (16N8C)	Nov 94
Functional Configuration Audit (16N8D)	Oct 91
Contractor Preliminary Inspection (16N8D)	Oct 91
Government Preliminary Inspection (16N8D)	Oct 91
Government Final Onsite Inspection (16N8D)	Feb 92
Functional Configuration Audit (16N8E)	Feb 95
Contractor Preliminary Inspection (16N8E)	Jan 95
Government Preliminary Inspection (16N8E)	Feb 95
Government Final Onsite Inspection (16N8E)	May 95

Appendix B to
ENCLOSURE (1)

Contractor Onsite Preliminary Inspection (I6N8F)	Aug 91
Government Onsite Inspection (16N8F)	Dec 91